REMARKS

Upon entry of the present Preliminary Amendment-A the claims in the application are claims 1-3, 6-10, 13-15 and 17-19, of which claims 1, 2, 7, 10, 14 and 18 are independent. Enclosed herewith is a check in the amount of $168.00 in payment of the fee for presentation of the 5th and 6th independent claims.

In the above amendments, claims 2-3 are amended to specify relative positions of defined components, based on the Examiner's suggestion at item 3 of the Office Action; claim 6 is amended to change "may be" to –are--; claim 10 is amended to define that at least one of a setting position adjusting means for said semiconductor laser and a setting position adjusting means for the condenser lens is provided ....; claim 14 is now rewritten as an independent claim similar to original claim 14 except that it defines a condenser and a reflector, rather than a condensing means and a reflecting means, and also defines that at least one of said condenser and said reflector has a surface having different radii of curvature...; claim 15 is amended to define that the condenser comprises a condensing lens, the reflector comprises a mirror, and both said condenser and said reflector have a surface having different radii of curvature...; claim 18 is a reinstatement of claim 5; and claim 19 is a reinstatement of original claim 6. Figs 22-24 are amended to add the label "Prior Art" as suggested by the Examiner at item 1 of the Office Action.

Applicant respectfully submits that all of the amendments presented are fully supported by the original disclosure, including the drawings and the original claims.

Further, applicant respectfully submits that the above amendments overcome the Examiner's objection to the drawings at item 1 of the Office Action and the Examiner's rejection of claims 2, 3, 6 and 15 under 35 USC 112, second paragraph, at item 3 of the Office Action. Accordingly, it is respectfully requested that such objection and rejection be reconsidered and withdrawn.

Art-Based Rejections

1. At item 5 of the Office Action, the Examiner has rejected claims 7-9 under 35 USC 102(b) as being anticipated by Kazuo (Japanese Patent Publication No. 2-52237). It is the Examiner's position that Kazuo's light scattering type particle detector includes all of the features set forth in claims 7-9, as reflected in Kazuo's Fig. 1 and components 1, 3, 6, 8 and 10.

Applicant's Response

Upon careful consideration applicant respectfully traverses such rejection, and submits that each of claims 7-9 is clearly patentably distinct over Kazuo, because Kazuo does not disclose or suggest a setting angle adjusting means as defined in the rejected claims, and correspondingly Kazuo's particle detector does not achieve the significant advantages which are achieved by the claimed invention as discussed in the specification.

In this regard, applicant notes the Examiner's comment at the end of the rejection regarding coincidence of the optical axes of the laser medium and the reflecting mirror in Kazuo's Fig. 1. To any extent that such comment indicates/implies that the claimed setting angle adjusting means feature is met by Kazuo's detector, applicant respectfully traverses same because from such figure, it is clear that Kazuo's detector does not include or in any way suggest the setting means as disclosed and claimed. Compare, for example, the setting arrangements according to embodiments of the present invention as disclosed in relation to Figs. 7-17 with the detector depicted in Kazuo's Fig. 1, and it is readily apparent that no such setting arrangements/means are included in Kazuo's detector. Relatedly, Kazuo does not address the problem of

conventional complex adjustment procedures as addressed and overcome by the present invention.

Moreover, applicant respectfully submits that given the "means plus function" format used in the rejected claims, according to US Patent & Trademark Office procedures, the Examiner is required to interpret such language as encompassing the corresponding structure disclosed in the specification and equivalents thereof. Clearly, Kazuo does not disclose the claimed setting means or any structure equivalent thereto.

Based on the foregoing, the rejection of claims 7-9 under 35 USC §102(b) is believed to be overcome, and accordingly it is respectfully requested that the rejection be reconsidered and withdrawn.

2. The Examiner has also rejected claims 1-3, 6, 10, 13-15 and 17 under 35 USC §103(a) as being unpatentable over Kazuo in view of Miura et al. (US Patent 5,583,635). It is the Examiner's position that while Kazuo's particle detector does not include various features set forth in the claims, it would have been obvious to persons skilled in the art at the time of the invention to incorporate such features into Kazuo's detector based on select teachings of Miura given that both references pertain to particle detection, or as matters of obvious design choice, etc.

Applicant's Response

Again, after careful consideration and in light of the above amendments, applicant respectfully traverses such rejection and submits that each of claims 1-3, 6, 10, 13-15 and 17 is clearly patentably distinct over the Kazuo and Miura references, because neither of the applied references, nor any other evidence of record, teaches important features of the claimed invention, and because the proposed modifications to

Kazuo's detector to include select features of Miura's particle measuring apparatus or to include other various modifications as matters of design choice, etc. are improperly based on suggestions coming entirely from the Examiner (guided by impermissible hindsight of the present disclosure), rather than from any teaching or suggestion of the references or from any common knowledge.

In relation to independent claim 1, applicant respectfully submits that the references provide no motivation to combine Miura's optical path changing mirror 12 with Kazuo's detector given the very distinct nature of the detectors and substances detected, as disclosed in the two references. For example, Mirua's apparatus measures particles and bubbles in a *liquid* using *a He-Ne laser source*, contrary to Kazuo's detector which measures particles in air using a semiconductor laser. In this regard, applicant respectfully submits that the Examiner's stated motivation (reducing noise and preventing optical feedback) does not come from the references because Miura does not indicate that these are characteristics of his mirror 12 .

Further, even if the teachings of the references were hypothetically combined, applicant respectfully submits that any combination resulting from the full, fair disclosures of the references, would not achieve or suggest the claimed invention, e.g., Miura's mirror 12 is not a "concave mirror", but is a prism shaped mirror, Miura does not disclose that there is predetermined non-linear angle formed between the core axes of the laser medium and the (concave) mirror. As disclosed in the present specification, these features are critical to achieving the a primary advantage of the invention, i.e., preventing laser light reflected from and/or transmitted through the laser medium from being reflected back to the semiconductor laser.

In relation to independent claim 2, applicant respectfully submits that neither Kazuo or Miura disclose a concave mirror which condenses light from the semiconductor laser to irradiate upon the flow path of a sample fluid to define a particle detecting region. Kazuo uses condensing lens 2 to condense light from the semiconductor laser to irradiate through laser medium 3 and then upon the flow path of a sample fluid to define a particle detecting region, whereas the mirror 6 reflects the condensed light such that resonance of the light arises between the mirror and an end face 4 of the laser medium 3. Similarly, the mirror 12 of Miura does not condense the laser light (such function instead being accomplished by the shaping convergence lens 13).

In this regard, applicant respectfully traverses the Examiner's allegation that it would be a matter of design choice to use a concave mirror (instead of the prism type mirror actually disclosed by Miura) because such allegation is not supported by the actual disclosures of the references or by any other evidence of record. Such different mirrors have significantly different characteristics, as conventionally recognized, so that it would never be obvious to substitute one for the other, especially given the other significant differences between the two detectors..

Regarding claim 3, applicant respectfully submits that the references do not disclose or make obvious the combination of a concave mirror and condenser lens which condense light from the semiconductor laser to irradiate upon the flow path of a sample fluid to define a particle detecting region, but teach other arrangements as discussed in relation to claim 2 above, while (again) the references do not disclose or make obvious the very significant feature of forming a predetermined non-linear angle

between the core axes of the laser medium and the concave mirror, as discussed above in relation to claim 1.

Regarding claim 10, applicant respectfully submits that neither reference discloses or suggests a setting position adjusting means for the semiconductor laser and/or a setting position adjusting means for the condenser lens for superposing the intensity distribution of the pumping laser light generated from the semiconductor laser on the intensity distribution of the laser light irradiated from the laser medium, as defined at the last clause of the claim. Again, attention is directed to applicant's arguments relative to the rejection of claims 7-9 above.

Regarding amended claims 14 and 15, applicant respectfully submits that neither Miura or Kazuo discloses or suggests the claimed feature of a reflecting mirror and/or a converging lens having different radii of curvature in the parallel direction and the perpendicular direction with respect to the flow path. As disclosed in relation to the 10^{th}-12^{th} embodiments of the invention (Figs. 18-21) the claimed mirror and/or lens permit broadening of the width of the particle detecting region 148 without deteriorating the energy density (intensity) of the laser light La. This, in turn, results in the ability to accurately monitor a great volume of fluid flowing through the flow path 142, as discussed at pages 40-41 of the original specification. Conversely, neither of Kazuo's condenser lens 2 and mirror 6 is disclosed as having the claimed feature. On the other hand, Miura's apparatus includes two lenses, only one of which condenses a laser beam (the lens closer to the sample cell 14), and such lens does not possess the claimed feature because it focuses the laser beam to a point within the sample cell as

shown in his Fig. 4, and hence does not achieve or suggest the advantages achieved by the claimed invention. Also, Miura's system does not include a solid state laser as claimed.

Further, applicant respectfully submits that persons skilled in the art would not consider it obvious to hypothetically modify Kazuo's laser oscillator to include the shaping converging lens of Miura and to include a reflecting mirror with different radii of curvature, as proposed by the Examiner, because the references provide no reason or motivation for doing so. Again, Miura's apparatus is specifically suited to distinguishing between particles and air bubbles in a liquid, involving transmission of the focused laser beam directly into the sample cell, after which any of the light passing straight through the cell is trapped in the beam trap 15. This is quite contrary to the laser oscillator of Kazuo which includes a semiconductor laser and generates laser light of sufficient intensity via resonance between a solid state laser medium and an outside mirror. The reason for use of the shaping converging lens system in Miura does not apply to Kazuo's detector, while there is no evidence of record establishes equivalence between Miura's reflecting mirror 6 and the reflecting mirror as claimed.

In this regard, applicant respectfully traverses the Examiner's allegation that it would be a matter of design choice to use any reflecting mirror is not supported by any evidence of record, but instead is contradicted by the evidence, including Miura which used a non-converging reflecting mirror 12.

ased on the foregoing, applicant respectfully submits that the rejection of claims 1-3, 6, 10, 13-15 and 17 under 35 USC §103(a) as being unpatentable over Kazuo in view of

Miura et al. Is believed to be overcome, and accordingly it is respectfully requested that the rejection be reconsidered and withdrawn.

Other Matters

New/reinstated claims 18-19 are believed to be allowable over the references of record based on the merits of the features recited therein, which are not disclosed or suggested by the references of record including Kazuo and Miura.

Conclusion

In conclusion, applicant has overcome the Examiner's objection and rejections as presented in the Office Action; and moreover, applicant has considered all of the references of record, and it is respectfully submitted that the invention as defined by each of the present claims is clearly patentably distinct thereover.

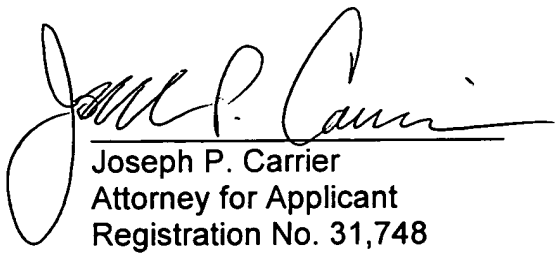
The application is now believed to be in condition for allowance, and a notice to this effect is earnestly solicited.

If the Examiner is not fully convinced of all of the claims now in the application, applicant respectfully requests that she telephonically contact applicant's undersigned representative to expeditiously resolve prosecution of the application.

Favorable reconsideration is respectfully requested.

A Petition for One-month Extension is being filed concurrently herewith.

Respectfully submitted,



Joseph P. Carrier
Attorney for Applicant
Registration No. 31,748
(248) 344-4422

Customer No. 21828
Carrier, Blackman & Associates, P.C.
24101 Novi Road, Suite 100
Novi, Michigan 48375
25June 2003